

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims

1. (Canceled) An isolated bacterial strain that oxidizes ammonia to nitrite, comprising a nucleotide sequence selected from the group consisting of: a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:3, a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:4, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:1 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:2.
2. (Canceled) The bacterial strain of claim 1 wherein the nucleotide sequence is identical to a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3 and SEQ ID NO:4.
3. (Canceled) A biologically pure culture of a bacterial strain that oxidizes ammonia to nitrite, wherein the 16S rDNA of the bacterial strain has a nucleotide sequence selected from the group consisting of: a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:3, a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:4, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:1 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:2.
4. (Canceled) The biologically pure culture of claim 3 wherein the nucleotide sequence is identical to a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3 and SEQ ID NO:4.
5. (Canceled) A composition comprising an isolated bacterial strain that oxidizes ammonia to nitrite, wherein said bacterial strain comprises a nucleotide sequence set forth in a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3 and SEQ ID NO:4.
6. (Canceled) The composition of claim 5 wherein the composition is in a form selected from the group consisting of liquid, frozen, freeze-dried and powdered.
7. (Canceled) The composition of claim 5, wherein the composition is included in a polymer.

9. (Canceled) The composition of claim 7, wherein the polymer is selected from the group consisting of acrylamide, alginate, carrageenan, and combinations thereof.

10. (Original) A composition comprising an isolated bacterial strain that oxidizes ammonia to nitrite, wherein said bacterial strain comprises a nucleotide sequence set forth in a sequence selected from the group consisting of SEQ ID NO:18, SEQ ID NO:19 and SEQ ID NO:20.

11. (Original) The composition of claim 10 wherein the composition is in a form selected from the group consisting of liquid, frozen, freeze-dried and powdered.

12. (Original) The composition of claim 10, wherein the composition is included in a polymer.

13. (Original) The composition of claim 12, wherein the polymer is selected from the group consisting of acrylamide, alginate, carrageenan, and combinations thereof.

14. (Canceled) A composition comprising a concentrated bacterial strain that oxidizes ammonia to nitrite, wherein the 16S rDNA of the bacterial strain has a nucleotide sequence selected from the group consisting of: a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:3, a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:4, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:1 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:2.

15. (Canceled) The composition of claim 14 wherein said bacterial strain has a 16S rDNA sequence which is identical to a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3 and SEQ ID NO:4.

16. (Canceled) The composition of claim 14, further comprising a microorganism selected from the group consisting of ammonia-oxidizing microorganisms, nitrite-oxidizing microorganisms, nitrate-reducing microorganisms, heterotrophic microorganisms, and combinations thereof.

17. (Original) A composition comprising a concentrated bacterial strain that oxidizes ammonia to nitrite, wherein the 16S rDNA of the bacterial strain has a nucleotide sequence selected from the group consisting of: a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:18, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:19 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:20.

18. (Original) The composition of claim 17 wherein said bacterial strain has a 16S rDNA sequence which is identical to a sequence selected from the group consisting of SEQ ID NO:18, SEQ ID NO:19 and SEQ ID NO:20.

19. (Original) The composition of claim 17, further comprising a microorganism selected from the group consisting of ammonia-oxidizing microorganisms, nitrite-oxidizing microorganisms, nitrate-reducing microorganisms, heterotrophic microorganisms, and combinations thereof.

20. (Canceled) An isolated nucleic acid comprising a sequence selected from the group consisting of: a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:3, a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:4, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:1 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:2.

21. (Canceled) The isolated nucleic acid of claim 20 wherein said sequence is identical to a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3 and SEQ ID NO:4.

22. (Original) An isolated nucleic acid selected from the group consisting of: a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:18, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:19 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:20.

23. (Original) The isolated nucleic acid of claim 22 wherein said sequence is identical to a sequence selected from the group consisting of SEQ ID NO:18, SEQ ID NO:19 and SEQ ID NO:20.

24. (Canceled) An oligonucleotide probe comprising a nucleotide sequence selected from the group consisting of SEQ ID NO:5 and SEQ ID NO:8.

25. (Canceled) An oligonucleotide probe that has at least 96% identity over the full length thereof to a nucleotide sequence selected from the group consisting of SEQ ID NO:5 and SEQ ID NO:8, wherein the oligonucleotide probe hybridizes to the nucleic acid of bacteria having 16S rDNA that has a nucleotide sequence selected from the group consisting of: a nucleotide sequence that

has greater than 98% identity over the full length thereof to SEQ ID NO:3, a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:4, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:1 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:2.

26. (Canceled) An oligonucleotide probe comprising the nucleotide sequence set forth in SEQ ID NO:21.

27. (Canceled) An oligonucleotide probe that has at least 96% identity over the full length thereof to the nucleotide sequence set forth in SEQ ID NO:21, wherein the oligonucleotide probe hybridizes to the nucleic acid of bacteria having 16S rDNA that have a nucleotide sequence that has at least 96% identity over the full length thereof to a sequence selected from the group consisting of SEQ ID NO:18, SEQ ID NO:19 and SEQ ID NO:20.

28. (Canceled) A polymerase chain reaction (PCR) primer selected from the group consisting of SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16 and SEQ ID NO:17.

29. (Canceled) A polymerase chain reaction (PCR) primer that has at least 96% identity over the full length thereof to a nucleotide sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16 and SEQ ID NO:17, wherein the PCR primer hybridizes to the nucleic acid of bacteria having 16S rDNA that has a nucleotide sequence selected from the group consisting of: a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:3, a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:4, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:1 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:2.

30. (Canceled) A polymerase chain reaction (PCR) primer selected from the group consisting of SEQ ID NO:22 and SEQ ID NO:23.

31. (Canceled) A polymerase chain reaction (PCR) primer that has at least 96% identity over the full length thereof to a nucleotide sequence selected from the group consisting of SEQ ID NO:22 and SEQ ID NO:23, wherein the PCR primer hybridizes to the nucleic acid of bacteria having

16S rDNA that have a nucleotide sequence that has at least 96% identity over the full length thereof to a sequence selected from the group consisting of SEQ ID NO:18, SEQ ID NO:19 and SEQ ID NO:20.

32. (Original) A composition comprising at least two bacterial strains that oxidize ammonia to nitrite, wherein each of the at least two bacterial strains have 16S rDNA including a nucleotide sequence independently selected from the group consisting of: a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:3, a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:4, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:1, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:2, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:18, a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:19 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:20.

33. (Currently amended) The composition of claim ~~30~~ 32, said composition comprising a bacterial strain with a 16S rDNA including a nucleotide sequence as set forth in SEQ ID NO:1, a bacterial strain with a 16S rDNA including a nucleotide sequence as set forth in SEQ ID NO:2, a bacterial strain with a 16S rDNA including a nucleotide sequence as set forth in SEQ ID NO:3, a bacterial strain with a 16S rDNA including a nucleotide sequence as set forth in SEQ ID NO:4, a bacterial strain with a 16S rDNA including a nucleotide sequence as set forth in SEQ ID NO:18, a bacterial strain with a 16S rDNA including a nucleotide sequence as set forth in SEQ ID NO:19 and a bacterial strain with a 16S rDNA including a nucleotide sequence as set forth in SEQ ID NO:20.